communications, not the two-way communications that telephony requires. For example, at the end of 1998, only 26 percent of TCI's facilities supported two-way communications.[152] Hence, cable companies are investing billions of dollars in upgrading their facilities to support two-way communications, but this process is slow and extremely capital intensive.[153] Even then, many residential customers representing scores of millions of households will not be reached. For these reasons, AT&T does not expect general availability of cable telephony to gain momentum until after 2000.[154]

Even as cable infrastructure is upgraded to support two-way communications, consumers must be convinced to purchase the service. Independent market research indicates that this task may present a significant and expensive challenge for cable telephony providers,[155] who must either convince consumers to purchase new telephony equipment or absorb those costs

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[152] TCI Communications 10K (1998).

[153] AT&T expects to spend more than $2 billion by the end of 2000 on upgrades while other cable service providers plan to spend approximately $9 billion of similar technological enhancements. *See* "Beyond the Hype: A Look at Cable's Plant Upgrades," Consumer Communications Report, The Yankee Group at 15, 16 (June 1998) (Time Warner, $4B; Comcast, $1.5B; MediaOne, $4.2B; and Cablevision; $160M).

[154] Many initial cable telecommunications service promotions are focusing on high-speed data services and therefore involve the deployment of cable modems. As a result, additional expense and delay may be required in many instances to allow upgraded cable infrastructure to support cable telephony through the installation of special Network Interface Units, Host Digital Terminals, and other customer premises equipment. *See, e.g.*, "Cable Telephony's Comeback: HFC Technologies and Operator Strategies," Consumer Communications Report, The Yankee Group p. 6 (Sept. 1998).

[155] Last year, the Yankee Group found that only 15.1 percent of technologically advanced families would be very likely or somewhat likely to subscribe to local telephone service from a cable television operator. "Cable Telephony's Comeback: HFC Technologies and Operator Strategies," *Consumer Communications Report*, The Yankee Group, p. 11 (September 1998). This rate is substantially higher when a long distance carrier provides the service, but still less than 50 percent. *Id.*

themselves.[156] Moreover, unlike with service provided using an unbundled local loop, a technician almost always must be dispatched to the customer premises to initiate telephony over cable. This service prerequisite will require cable telephony providers to incur the additional expense of "tens and tens of million man hours" in order to offer widespread service.[157]

3. The Commission Should Reaffirm That Incumbent LECs Are Obligated To Unbundle xDSL Capable And xDSL Equipped Loops.

In its *Advanced Services Order*, the Commission confirmed that incumbent LECs are subject to the unbundling requirements of Section 251(c) in their provision of advanced services.[158] The Commission also confirmed that "all incumbent LECs must provide requesting telecommunications carriers with unbundled loops capable of transporting high-speed digital signals, and must offer unbundled access to the equipment used in the provision of advanced services, subject to considerations of technical feasibility and the provisions of section 251(d)(2)." *Id.* In the follow-on rulemaking proceeding, AT&T demonstrated that it is technically feasible for incumbent LECs to provide three types of loops: a "basic loop;" an "xDSL capable loop;" and an "xDSL equipped loop."[159] Thus, the only issue outstanding with

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[156] A digital telephone set costs around $250 if the customer has a digital cable hook-up and around $500 if the customer does not. *Communications Daily* (March 17, 1999) (*quoting* AT&T President Leo Hindrey at Merrill Lynch Annual Global Telecom Conference).

[157] *Id.*

[158] Memorandum Opinion and Order and Notice of Proposed Rulemaking, *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket No. 98-147, FCC 98-188 (1998) ("*Advanced Services Order*") ¶ 11. The rulemaking proceeding shall be referred to herein as the "*706 NPRM.*"

[159] *See, id.* Comments of AT&T Corp. (filed Sep. 25, 1998) ("*AT&T 706 NPRM Comments*"), at 39-65; *id.* Reply Comments of AT&T Corp. (filed Oct. 16, 1998) ("*AT&T 706 NPRM Reply Comments*"), at 42-67.

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respect to incumbent LEC provision of xDSL capable loops and xDSL equipped loops is whether modifying the electrical characteristic of the UNE loop creates a "separate UNE" necessitating separate evaluation of each variation under the "necessary and impair" standard under section 251(d)(2). As demonstrated below, there is simply no reason for the Commission now to depart from the functional definition of UNEs and to shift to specific provisioning arrangements, equipment deployment or performance parameters as a basis for differentiation among UNEs. Such a last minute change would generate endless unnecessary debate regarding the definition of UNEs.

The Commission's previous discussions defining network elements have been based upon functionality provided by the incumbent LEC, not the specific method employed to deliver such functionality, and this approach has been affirmed both by the Eighth Circuit and the

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A **basic loop** is a transmission facility capable of transmitting communications, in the voice band, between the incumbent's central office switching element or elements, and the network interface device at the customer premises.

An **xDSL capable loop** is a basic loop stripped of data transmission degrading equipment such that the loop's electrical characteristics will permit the transmission of communications both within the voice band and within one or more modulated data channels in frequency ranges above the voice band. Such data channels are derived through end user and network-deployed transmission enhancing equipment subsequently added to the loop, such as DSLAMs and splitters. An xDSL capable loop must be certified as capable of supporting the specified advanced data service without undue spectral interference.

An **xDSL equipped loop** is a basic loop that includes all necessary transmission enhancing equipment within the local network, such as a DSLAM and splitters, to deliver communication in both the voice band and one or more derived data channels that are transmitted above the voice band when the retail customer provides compatible transmission enhancing equipment at the subscriber's premises. The xDSL equipped loop must deliver voice and data traffic without undue spectral interference to the first technically feasible point of interconnection in the central office or, if there is no technically feasible point of interconnection in the central office, then at some technically feasible point further into the incumbent LEC's network.

Supreme Court.[160] It should not be disturbed on remand. The functionality provided by the local loop is incumbent LEC-provided connectivity from the CLEC customers' premise to the local network switching capabilities or the CLEC's point of interconnection, whichever occurs first in the CLEC's design of its network.[161] Concluding that basic, xDSL capable and xDSL equipped loops are separate UNEs would call into question whether 2-wire analog loops, 4-wire analog loops, or 2-wire digital loops are separate elements. Each of these loop types is distinguishable based on both physical and electrical characteristics, yet no one has suggested that they should be treated as separate network elements. Indeed, it would it be unreasonable to do so. Nor is there any basis under the Act or the Commission's Rules to identify different loop UNEs based upon the service a CLEC may provide through the use of the loop element.[162]

In all events, however, there is no doubt that xDSL capable and equipped loops are necessary to CLECs' ability to provide the advanced services that are likely to be increasingly important and desirable aspects of local exchange service. The lack of access to such loops would materially impair the CLECs' opportunities to provide competitive services.[163]

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[160] *See Iowa Utils. Bd.*, 119 S. Ct. at 733-34; *Iowa Utils. Bd.*, 120 F.3d at 808-9; *First Report and Order* ¶ 264.

[161] Because the CLEC is entitled to all features and functionality of the UNE, the CLEC would be entitled to all the spectrum that is technically feasible to utilize in a loop.

[162] *First Report and Order* ¶ 292.

[163] The ability to make such a showing, however, does not warrant creation of a separate UNE for each these classifications within the overall loop UNE. Rather, the Commission should reaffirm that incumbent LECs are obligated to provide basic, xDSL capable, and xDSL equipped loops as part of their overall obligation to provide unbundled loops.

a. xDSL Capable Loops

In the *706 NPRM*, no RBOC disputed its obligation to make xDSL capable loops available to new entrants as an unbundled network element under Section 251(c)(3).[164] This result necessarily flows from the fact that CLECs need access to unbundled loops, regardless of their engineered characteristic or how they are employed to provide retail services, and that CLECs' ability to provide competitive service would be significantly impaired if they were denied unrestricted access to such elements.

Modification of a loop's operational parameters does not change the loop's functionality nor does it alter the fact that lack of access to the loop would impair new entrants' ability to meet the service needs of the customer served by that loop. Thus, the incumbent's decision to place or remove equipment such as load coils on a loop has no bearing on whether the loop performs the functions of the loop UNE element. The addition and removal of such equipment occurs on a daily basis throughout the incumbent LECs' loop plant, as a means to modify the usable loop spectrum. Adding voice coils enhances transmissions in the spectrum below 4 kHz (voiceband) at the expense of transmission capabilities in the spectrum above that frequency (broadband). Similarly, adding a DSLAM enhances transmission in the higher (*e.g.*, above 4 kHz) spectrum. Requiring incumbents to modify the loop's operational characteristics by removing or adding such equipment simply gives effect to the Commission's previous finding that the incumbent LEC must make all features, functions, and capabilities of the loop (in this case spectral

[164] *See, e.g., 706 NPRM*, Reply Comments of Ameritech at 4; Bell Atlantic Reply Comments at 32; Reply Comments of BellSouth at 27; Reply Comments of SBC at 30; Reply Comments of U S WEST at 4-8 (all filed Oct. 16, 1998).

capacity) available to CLECs, rather than limiting the features, functions, and capabilities of the loop to those that the incumbent LEC has chosen to provide.[165]

The Commission has correctly found – and the Eighth Circuit has affirmed – that the kind of loop conditioning required to provide xDSL capable loops (which involves removing all passive or active electronics such as bridge taps, low pass filters, and range extenders) constitutes a "modification" necessary for incumbents to meet their obligations to provide nondiscriminatory access.[166] This conclusion is particularly appropriate in the context of advanced services, because conditioning a loop to provide advanced services simply facilitates use of a loop's *existing* features, functions, and capabilities. Indeed, there is no dispute that CLECs could not provide advanced services without such conditioning. Hence, Ameritech has conceded that an incumbent "is required to make reasonable modifications to its existing facilities, such as conditioning, to the extent necessary to accommodate interconnection or access to network elements."[167]

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[165] *First Report and Order* ¶ 260; *see also* Opposition to AT&T Corp. to the Petitions of Bell Atlantic Corporation and SBC Communications, Inc. for Reconsideration, *Deployment of Wireline Service Offering Advanced Telecommunications Capability*, CC Docket Nos. 98-147, et al., p. 2 (filed October 5, 1998).

[166] *First Report and Order* ¶ 382; *Iowa Utils. Bd.* v. *FCC*, 120 F.3d at 813, n.33 ("we endorse the Commission's statement that 'the obligations imposed by sections 251(c)(2) and 251(c)(3) include modifications to incumbent LEC facilities to the extent necessary to accommodate interconnection or access to network elements.' . . . The petitioners themselves appear to acknowledge that the Act requires some modification of their facilities.") (citations omitted). *See also Advanced Services Order* ¶ 182, n.285 (incumbent LEC must undertake loop conditioning and other "affirmative steps to condition existing loop facilities to enable requesting carriers to provide services not currently provided over such facilities" at the expense of the requesting carrier).

[167] *706 NPRM*, Comments of Ameritech (filed Sept. 25, 1998), at 11-12.

b. xDSL Equipped Loops

An xDSL-equipped loop is a loop that uses Digital Subscriber Line Access Multiplexer (DSLAM)-type equipment on the carrier's end which, when combined with equipment provided by a subscriber, enables the carrier to provide advanced services that require greater bandwidth than ordinary voice telephony.[168]

DSLAM-type equipment, whether installed by the incumbent LEC in a central office or in a remote terminal, is nothing more than transmission-enhancing equipment similar to load coils that support higher quality voice-grade traffic over longer loops and Digital Loop Carrier ("DLC") or other multiplexing equipment that allows greater concentration of loop traffic between a remote terminal and a central office. When a DSLAM is employed, it allows the loop to support greater bandwidth over a longer distance than would be possible without such equipment. When such equipment is deployed, the available loop spectrum (*i.e.*, the ability of the loop to carry signals over different frequencies – which is the basic functionality provided by the loop) is more fully utilized.

The Commission has repeatedly held that equipment placed on a loop to facilitate transmission is part of the loop, *i.e.*, not a separate element.[169] Thus, in cases where the

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[168] The current equipment used to provide such advanced services requires the use of a copper loop. Thus, in order to provide such services, CLECs must have access to a copper loop facility serving the customer's premise.

[169] This is not unlike the unbundling obligation of dedicated transport where, as part of the general obligation to unbundle such transport, the incumbent is obligated to provide a variety of bandwidth capabilities (e.g., DS0, DS1, DS3 and OC-n). Such differentiation is not driven by any finding that different dedicated UNEs exist for transport but, rather, that differences in economic costs can be better reflected by such distinctions. The same is true for loop unbundling. The loop functionality is supportable under the necessary and impair standard with the distinction between any loop type appropriately being driven by demonstrable cost differences. While guidance to the states is appropriate with respect to the TELRIC pricing for different types of loops that incumbents should offer (because of expected cost differences), once
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incumbent is technically able to provide such equipment on a customer's loop, straightforward application of the Act's nondiscrimination obligations requires that a new entrant must be able to obtain the use of such equipment as part of the loop as well.[170]

c. Denying CLECs Access To xDSL Capable And xDSL Equipped Loops Would Seriously Impair Their Ability To Compete.

Without the availability of xDSL capable and xDSL equipped loops on an unbundled basis, incumbent LECs will have an insurmountable competitive advantage over CLECs. As shown above, new entrants cannot begin to compete with entrenched incumbents unless they have nondiscriminatory access under section 251 to the "last mile" of the incumbent's network. That conclusion applies to each type of loop that it is technically feasible for incumbent LECs to provide. The Commission's affirmation that incumbents must provide these types of unbundled loops will clarify incumbent LECs' unbundling obligation and accelerate CLECs' deployment of local services, including advanced data services.

In particular, the comments in CC Docket 98-147 demonstrate that unbundled access to equipped loops is essential due to the incumbent LECs' increasing deployment of remote terminals and DLC loop configurations.[171] By moving equipment that enhances the useable loop spectrum, such as DSLAMs, closer to the customer, an incumbent can vastly increase the type

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the Commission finds that loops must be unbundled, then the incumbent has a clear obligation to provide any loop that is technically feasible to provide.

[170] *See, e.g., First Report and Order* ¶ 391 (rejecting proposal to define a loop concentrator as a subloop element and instead treating it as part of the loop); *id.* ¶ 383 (discussing loops that contain IDLC equipment).

[171] *See, e.g., 706 NPRM*, Comments of BellSouth (filed Sept. 25, 1998) at 26 ("BellSouth and other ILECs continue to place fiber deeper into their networks").

and quality of services it can offer, as well as the number of customers they can serve. For example, full motion (broadcast quality) video services can be supported if DSLAM type equipment is placed in remote terminals so that the final copper segment to the customer's premises is 3,000 feet or less. If new entrants cannot provide similar functionality – because they cannot put their own equipment in the remote terminal or otherwise gain access to the "short" copper segment – then they will be effectively precluded from offering competitive advanced services. And, if the incumbent LEC's decision to deploy equipment closer to the customer precludes CLECs from providing such services, the CLECs' inability to provide a full suite of services will also affect customers' willingness to purchase less sophisticated (*e.g.*, voice) services from them, both local and long distance. New entrants, therefore, must be able to access loops with equivalent bandwidth capability to the bandwidth that the incumbent LEC (or any affiliate of the incumbent LEC) can employ in offering retail or access services. Such nondiscriminatory access can be accomplished if the Commission clarifies that incumbent LECs must provide the CLECs with the option of an unbundled equipped loop provided by the incumbent whenever: (i) the incumbent or an affiliate of the incumbent has offered to provide xDSL capabilities, whether through an access or retail service; or (ii) lack of collocation space (whether in the remote terminal or central office) or the equipment deployed by the incumbent LEC (*e.g.*, IDLC) inhibits CLEC attempts to offer competitive services to its customers.[172]

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[172] "Home run" copper (*i.e.*, copper between the subscriber's premise and the serving office) often does not exist, or has been replaced by DLC because it has deteriorated. Installing new copper is not practicable because incumbent LECs typically "offer" home run loops only if the CLEC is willing to pay thousands of dollars in "special construction" charges to build the loop. This, in turn, makes it imperative that CLECs that wish to deploy their own DSLAMs have access to the incumbent LEC's copper distribution facilities. In order to do so, CLECs can use low-intrusion configurations such as a cross-box to cross-box interconnection arrangement that would not present any significant space or safety concerns for incumbent LECs. *See 706 NPRM*, (continued . . .)

It is essential that the Commission address the potential for discrimination by incumbent LECs in the provision of advanced data services. Space exhaustion in remote terminals and central offices may make it impossible for a CLEC to collocate DSLAMs, but the incumbent LEC may already be using a DSLAM in that location with spare or expandable capacity to serve its own retail customers. Similarly, incumbent LECs may soon deploy DLC equipment that accommodates line cards supporting xDSL services. Deployment of such equipment will make xDSL deployment to incumbent LEC retail customers independent of distance, but, absent space in the remote terminal for a CLEC's DSLAM, the only means for a CLEC to compete would be through access to an equipped loop.[173]

Even where collocation space is available, access to equipped loops is necessary to enable the development of local telecommunications competition. Such competition, including access to advanced services, will be forestalled if new entrants are required to collocate in every incumbent LEC central office or remote terminal, and are thereby required to incur the costs and

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Comments of BellSouth, at 50 (cross-box to cross-box arrangement "allow[s] the competitor to access the unbundled network elements that it has obtained without compromising the security or integrity of its (or the incumbent LEC's) network"). Entrants also need to be able to access unbundled loops at or near the remote terminal, through transmission media, including but not limited to fiber or copper transmission cables, and to install their own transmission enhancing equipment (such as DSLAM functionality, DLC equipment, or both). And in order to facilitate these methods of access to unbundled loops, incumbents must provide in such cases any access to rights-of-way or other pathways that the entrants need to perform cross-box to cross-box interconnection and similar arrangements.

[173] Modification of the loop to provide xDSL functionality does not constitute creation of a superior network because, among other things, it is the same network arrangement and service that the incumbent LEC is providing to its own customers. In fact, if the CLEC's customer had requested the xDSL service from the incumbent LEC instead, the incumbent LEC would have modified an xDSL capable loop in the same manner.

significant delay associated with collocation.[174] As demonstrated below with respect to unbundled local switching, new entrants can avoid the needless expense and delay of collocation through use of combinations of network elements, thereby enabling the provision of competitive services to the broadest base of possible customers.

Critically, Congress and the Act did not envision or intend that competition be limited to traditional voice services. Indeed, Congress made specific provision for the development of advanced services. Therefore, the Commission must set in place the conditions that permit competition to flourish for all types of service. Such steps include assuring that necessary loop types are readily available and that CLECs serving customers through the unbundled network element platform are not restricted to competing solely for customers interested only in a voice offering. As competition develops and needs change, many customers that a CLEC serves via the "platform" will want to add high speed Internet access after they have switched from the incumbent LEC retail offering. Further, retail customers of the incumbent LEC should not be barred from changing quickly and easily to a CLEC that has entered the market though a UNE-based strategy simply because they currently have an xDSL type service with the incumbent LEC. Finally, a CLEC utilizing a UNE-based entry strategy must be capable of offering not only voice but also advanced data services if it is to be a credible competitor in the local services market place. Thus, CLECs must have unrestricted access to a variety of loop types and CLECs must be permitted to use xDSL equipped loops, not just basic loops in a UNE-P combination.[175]

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[174] Although the Commission's recently revised collocation rules attempt to ease the burden associated with collocation, it is not clear whether and to what degree they will be followed by incumbent LECs.

[175] With an equipped loop, the subscriber's data traffic would be split from its voice traffic at the incumbent LEC's DSLAM. The voice traffic would be routed to the local switch, where the CLEC would obtain local switching as an unbundled network element. The commingled (continued . . .)

In short, new entrants cannot provide competitive advanced services at all without access to xDSL conditioned loops, and incumbent LECs do not contest this fact. Moreover, simple nondiscrimination obligations require that CLECs be able to obtain xDSL equipped loops – or, in appropriate circumstances, be able to use cross-box to cross-box interconnection arrangements – in order to offer such advanced services. Finally, a mandatory collocation requirement (which would result from a decision to deny CLECs access to xDSL equipped loops) would significantly impede CLECs' ability to deploy basic voice and advanced services on a broad scale.

4. The Commission Should Promote Competition By Clarifying Several Loop Related Issues.

The Commission should take the opportunity afforded by this proceeding to clarify some additional loop related issues. These issues involve the incumbent LEC deployment of loop extensions to customer premises, network interface devices ("NID"), incumbent LEC riser cable, loop distribution, and multiplexing equipment.

Loop extensions to customer premises. AT&T has experienced substantial difficulties in situations where it seeks to use unbundled loops to serve customers to whom the incumbent has not yet extended its facilities. For example, where a business customer AT&T has been serving through unbundled loops constructs a new building, in some instances the incumbent LEC has refused to provide AT&T unbundled loops to that building. In those instances, the incumbent

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incumbent LEC and CLEC data traffic would be sent to the first place where the CLEC subscriber's data could be identified and separated from the traffic of other retail service subscribers, whether incumbent LEC or CLEC. This would ordinarily be at the incumbent LEC's ATM switch, but could also be at a simple router. The CLEC would then pick up its traffic and perform necessary data switching and transport within the CLEC's data network. The CLEC would not use the incumbent's data switch (other than to obtain its customers' traffic), nor would the CLEC use the incumbent's data network beyond the point at which the CLEC's customers data traffic was separated. Such an arrangement would utilize the existing functionality of off-the-shelf equipment, and thus is clearly technically feasible.

LEC has admitted that it would routinely extend its extensive existing loop facilities that honeycomb the area to connect to that building if the customer would order service from it, but claims it has no obligation to make such a trivial extension if the order is for an unbundled network element because the extension is not itself yet a part of the incumbent LEC's existing network. The same claim could potentially arise when a residential customer moves into a newly constructed home or seeks an additional line to an existing home.

The Commission should make clear that such conduct constitutes unlawful discrimination. If the incumbent would extend its loop facilities if the customer ordered local service from it, then it must likewise provide access to such a facility if a CLEC orders it as an unbundled network element. In the absence of such a rule, CLECs would suffer serious competitive disadvantages in attempting to serve such customers, because the incumbent LEC, which has facilities throughout the area, would have to incur only the minor cost of having to extend those facilities to connect them to a particular location, while a CLEC would presumably have to construct an entirely new loop.[176]

NID. Recognizing that "[i]n many cases, inside wiring is connected to the incumbent LEC's loop plant at the NID[,]" the Commission concluded in the *First Report and Order* (at ¶¶ 392-93) that "the unavailability of access to incumbent LECs' NIDs would impair the ability

[176] *See Iowa Utils. Bd.* v. *FCC*, 119 S. Ct. at 737 (upholding Rule 315(b) as an "entirely rational" application of the Act's "nondiscrimination requirement" because it prevents incumbent LECs from "impos[ing] wasteful costs" on CLECs that the incumbent LEC does not itself incur). Alternatively, of course, the CLEC could simply ask the customer to order service from the incumbent (or the CLEC could place a resale order with the incumbent), and the CLEC could then place the UNE order immediately after the extension has been completed and is then, even in the LECs' parlance, part of the LEC's "existing network." But it would be pointless to require those extra steps, and they illustrate that the incumbent LECs' distinction between their "existing networks" and the extensions that are sometimes necessary to hook up new customers to those networks is meaningless.

of carriers deploying their own loops to provide service." The Commission should reaffirm that decision. Further, to prevent anticompetitive behavior, the Commission should clarify that (i) incumbent LECs may not preclude new entrants from accessing the customer side of the NID, without charge from the incumbent LEC, and (ii) where the point of demarcation between the incumbent LEC's outside loop facility and the customer's inside wire is not a clearly identifiable physical device, incumbents may not preclude new entrants from accessing any space and any facility accessible by the incumbent LEC for purposes of accessing and re-terminating the customer's inside wire. These clarifications are necessary to permit new entrants to connect the customer's inside wire to their own loop facilities by removing the customer's inside wire from the incumbent LEC's NID and attaching it to the CLEC's own device.[177]

The Commission should also explicitly state that when the incumbent LEC provides the unbundled loop, the NID must be provisioned in an integrated manner with the loop, unless the requesting telecommunications carrier directs that the NID need not be provided by the incumbent LEC. The NID and the loop are connected throughout the incumbent LECs' networks as a routine matter. There is no reasonable rationale that supports a requirement that the NID must be touched when a CLEC obtains a NID and loop in combination. This would needlessly increase the CLEC's costs with no benefit to the customer.

Incumbent LEC riser cable. Riser cable located on customer premises and owned by the incumbent LEC is an extension of the loop. In most instances, building owners are not likely to have sufficient space available to accommodate multiple risers. Even if they do, it would present

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[177] Neither clarification would involve the CLEC's actual use of the incumbent LEC's NID, or the connection of CLEC wiring at the NID. *See First Report and Order* ¶ 394.

building owners with an opportunity to charge CLECs excessive fees. Consequently, the Commission should clarify that CLECs are entitled to nondiscriminatory access to incumbent LEC controlled riser cable in order to provide local and exchange access services. Without such access, incumbents potentially could preclude both facilities-based and UNE-based competitive entry to many buildings by exerting control over those bottleneck facilities.

Loop distribution. The bottleneck properties of loop distribution are becoming increasingly important as incumbent LECs continue to push fiber closer to the customer in their loop plant.[178] These efforts facilitate higher speed data transmission using xDSL technology, but they may do so at the expense of competition, unless CLECs are free to deploy their own SONET rings and lease loop distribution from the incumbent LEC. Without unbundled loop distribution, CLECs could be precluded from deploying alternative high-speed data services.

Multiplexing equipment. The Commission should clarify that the definition of the local loop includes multiplexing equipment regardless of where the equipment is attached to the loop. As a result, the incumbent LEC should be obligated to provide, at cost based rates, loop multiplexing functionality even if the CLEC requests this functionality at the central office. Such multiplexing should be available in a format consistent with that required to directly terminate on a switch. Such arrangements clearly are technically feasible. Moreover, this administrative clarification is consistent with the Commission's previous holding that the local loop includes cross connect equipment as does dedicated transport.[179]

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[178] The past three years of state arbitrations and Commission proceedings have generated ample evidence that loop distribution unbundling is technically feasible. Moreover, given that the loop is a bottleneck element, it clearly follows that any subloop elements are bottleneck elements as well.

[179] *First Report and Order* ¶¶ 386, 444.

B. Local Switching

Access to unbundled local switching at cost-based rates is essential if CLECs are to provide broad-based, mass market competition to the incumbent LECs. Absent such access, CLECs' ability to serve nearly all residential customers and most business customers would be severely impaired. If significant broad-scale competition is to develop now or in the foreseeable future, the Commission must require incumbents to provide cost-based access to the unbundled local switching element, both individually and in combination with other unbundled elements (*e.g.*, "UNE-P").

Mass market competition for residential and business customers depends on cost-based access to unbundled switching for two key reasons. *First*, CLECs incur significant costs in using their own switches that incumbent LECs, by virtue of their historic status as monopoly providers, do not. This inherent cost differential reflects the inescapable fact that virtually all customers' loops terminate today at an incumbent LEC switch. Thus, CLECs, unlike incumbent LECs, must incur substantial costs first to disconnect their new customers' loops from the incumbent LEC switch and then to extend those loops to the CLEC's switch using interoffice transport facilities. These costs alone are sufficient to preclude CLECs from competing for most customers. And they are compounded by additional significant costs, such as the lack of access to unbundled shared transport, which necessarily would follow from a denial of access to unbundled switching. Indeed, it is not surprising that incumbent LECs currently have deployed 25 times the number of switches deployed by all CLECs and CAPs *combined*. The enormous capital investment in switching needed to support mass market entry is simply not justifiable given all the costs associated with extending incumbent LEC loops to a CLEC switch.

Second, and equally important, CLECs' ability to use their own switches to compete is severely restricted because of their dependence upon the manual "coordinated hot-cut" process

that incumbent LEC technicians must perform to transfer each and every former incumbent LEC customer's loop to a CLEC switch. In this time-consuming process, incumbent LEC technicians must manually disconnect and reconnect each customer's wires and coordinate these steps with other technicians and CLEC personnel so that the customer's existing telephone number is reassigned or "ported" to the CLEC's switch simultaneously with the performance of the hot-cut. Experience to date conclusively demonstrates that the coordinated hot-cut process cannot support broad-based mass market entry. In particular, the coordinated hot-cut process:

(i) cannot provision orders in the volumes needed to support mass market entry on a broad scale;

(ii) cannot respond effectively to the unpredictable demands of such mass market entry; and

(iii) has to date been so error-prone that CLECs have not been able to rely upon it even to provide commercial quality service to customers whom it otherwise makes sense to serve using a CLEC's own switches.

As a result, the coordinated hot-cut process cannot accommodate mass market entry by all CLECs and would likely lead to severe customer backlash against the CLEC industry in general. For CLECs to offer meaningful broad-based competition, they must be able not only to market their services widely and aggressively, but also to follow up their marketing efforts by quickly and reliably providing service to the new customers who respond. If CLECs are permitted to use unbundled incumbent LEC switching in combination with the other unbundled elements established in the *First Report and Order*, new customers' installations could occur in much the same way they do for the incumbent LEC, and existing incumbent LEC customers could move to a CLEC with the same ease that retail customers now move among long-distance

service providers, *i.e.*, with a software change that occurs almost instantaneously. This would permit CLECs to compete effectively for large numbers of customers from the outset, and, if economic conditions permit, to move customers to their own facilities at an appropriate time and on a planned basis, with minimal service disruption.

These facts demonstrate that the Act's goal of ensuring that all business and residential consumers have a choice of providers for local telephone service cannot be met in the foreseeable future if CLECs are denied access to unbundled local switching. By providing CLECs with three paths of entry, Congress tried to ensure that CLECs would be able to tailor various entry strategies to fit particular product and geographic markets and business plans.[180] To deny CLECs access to unbundled local switching individually and in combination with other elements is to remove the only viable near-term path to broad-based mass market entry, a significant impairment to CLECs that will perpetuate the incumbent LECs' monopoly control over most of their customers.

1. Without Unbundled Local Switching, CLECs Would Be Precluded Economically From Competing For Most Customers.

CLECs require cost-based access to unbundled local switching because they would face substantial cost disadvantages when attempting to deploy and use their own switches for broad-based entry. As an initial matter, the requisite capital investment required for a broad, switch-based market strategy is huge. Despite steady investment in their own switches over the last three years, CLECs to date have installed only a tiny fraction of the switches that the incumbent

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[180] *First Report and Order* ¶ 12 ("[O]ur obligation . . . is to establish rules that will ensure that all pro-competitive entry strategies may be explored. As to success or failure, we look to the market, not to regulation, for the answer." Moreover, "[w]e anticipate that some new entrants will follow multiple paths of entry as market conditions and access to capital permit. . . .[Some CLECs] may use a combination of entry strategies simultaneously – whether in the same geographic market or in different ones").

LECs have deployed – an amount that is plainly insufficient to compete with the incumbent LECs for most residential and business customers. The gap in the number of switches needed for broad-scale competition reflects, in part, the enormous size of the investment and the long lead times needed to deploy such a large number of switches. But most fundamentally, the gap reflects the fact that switch-based entry is not an economically viable means to compete for most new customers, especially residential and smaller business customers.

In particular, CLECs that deploy their own switches in order to enter a local market must incur significant costs that incumbent LECs do not. These costs result first from the basic, inescapable fact that local networks were designed by and for a monopolist, so that the loops of an incumbent LEC's customers all terminate at an incumbent LEC switch. To serve these customers, CLECs incur additional and substantial costs – that the incumbent LECs need never incur – to connect their new customers' loops to remotely located CLEC switches. This cost disadvantage alone is so significant that it alone precludes effective competition for most customers. The disadvantage would be compounded, moreover, by the fact that CLECs, if required to use their own switches, would incur "significantly increase[d] . . . costs" of being denied the ability to use unbundled shared transport.[181] The only way for new entrants to compete successfully with the incumbent LECs, who enjoy "significant economies of scope, scale, and density in providing transport facilities," *id.* at 12482 ¶ 35, is by permitting CLECs access to unbundled local switching, which is a precondition of access to shared transport.

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[181] Third Order On Reconsideration and Further Notice of Proposed Rulemaking, *In the Matter of Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, CC Docket No. 96-98, 12 FCC Rcd 12460, 12481, ¶ 34 (Aug. 18, 1997) ("*Shared Transport Order*").

a. CLECs Do Not Have Enough Switches Today To Offer Service To Most Customers, And Adding Sufficient New Switches Quickly Is Impractical.

When considering whether CLEC access to unbundled switching meets the statutory impairment standard,[182] the Commission should first recognize that the cost of bringing each and every customer loop to the CLECs' switches comes on top of the need for significant lead time and substantial costs associated with CLEC switch deployment.

The incumbent LECs' huge investment in their extensive switching facilities is well-documented. Incumbent LECs maintain over 24,000 switches across the country, FCC Statistics of Communication Common Carriers, Table 2.10 p. 137 (Nov. 30, 1998), and based on recent ARMIS data filed by the incumbent LECs with the Commission, they have over *$60 billion* invested in digital and analog switching alone, not including the necessary investment in buildings and environmental conditions used to house and operate such equipment. By comparison, as described in the attached affidavit of C. Michael Pfau, CLECs (and CAPs) have

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[182] In the *First Report and Order*, the Commission treated as "proprietary" only those elements "with proprietary protocols or . . .containing proprietary information," *First Report and Order* ¶ 282. With respect to switching, the Commission observed that "the vast majority of parties that discuss unbundled local switching do not raise proprietary concerns with the unbundling of either basic local switching or vertical switching features." *Id.* ¶ 419. This lack of comment, in turn, reflects the reality that CLECs, in using unbundled switching, do not gain access to any proprietary protocols or proprietary information in a manner that would allow the CLEC to replicate and use that information. Pfau Aff. ¶ 81. For this reason alone, unbundled switching does not implicate the "necessary" standard. Moreover, with respect to some incumbent LECs' claims that they are "not at liberty to sublicense" to CLECs software that was licensed to them by third parties (*see First Report and Order* ¶ 419), that is simply a red herring. Section 251(c)(3)'s nondiscrimination requirement prohibits incumbent LECs from procuring or accepting language in their contracts with third-party vendors that would permit them to use their network elements in certain ways while denying to CLECs access to those same functionalities. Accordingly, if such contracts exist, incumbent LECs must negotiate with the vendors and obtain whatever amendments or additional licenses are necessary to eliminate the discrimination. *See* Comments of AT&T Corp., *Petition for MCI for Declaratory Ruling*, CC Docket 96-98, CCBPol 97-4 (filed Apr. 15, 1997). And because CLECs will then have, as the Act requires, the same rights of access to the element as the LEC enjoys, no proprietary concerns are even implicated.

installed fewer that 600 switches, and those switches are located largely in selected urban areas with a high concentration of businesses.[183] Only a few states have more than ten CLEC/CAP switches deployed within their boundaries and ten states have only one CLEC switch or none at all. In only three localities – New York, Delaware, and the District of Columbia – does the number of switches deployed by all CLECs or CAPs combined represent more than $1/10^{th}$ the number deployed by the incumbent LECs, with the latter two having but four and five switches deployed, respectively. Of course, the gap in switch deployment that any *individual* CLEC needs to close in order to compete with an incumbent LEC is far greater still.

As a practical matter, neither small nor large CLECs are likely to close this wide gap, especially in the short term. *First*, as explained further below, the necessary extraordinary investment is not cost-effective for serving all customers. *Second*, switches simply cannot be deployed rapidly in the numbers needed to close the gap. On average, to deploy a *single* new switch, assuming conditioned central office space already exists, takes nine to twelve months. Pfau Aff. ¶ 14. Where a CLEC must obtain and/or condition new central office space, even more time may be required. *Id.* ¶ 15; *see First Report and Order* ¶ 411 & n.911 ("it takes between nine months and two years for a carrier to purchase and install a switch"). Thus, even assuming an unlimited supply of switches (and a sufficient number of trained installers and engineers) were available, it would take at least several years before CLECs could install enough switches

[183] Pfau Aff. ¶¶ 11-13 & Att. 1. AT&T estimated the number of CLEC and CAP switches using information from the LERG that was calibrated against figures reported by the FCC. Pfau Aff. ¶ 12 n.2. The estimate likely overstates the number of CLEC/CAP switches because the precise number of CLEC/CAP switches that are effectively "data only" and "tandem only" (and which should be excluded) could not be definitively established. *Id.* Finally, because the number represents the combined number of CLEC/CAP switches, which will be used by CLECs to compete against incumbent LECs and each other, it greatly overstates the competitive impact of switches available to any one CLEC.

to provide customer coverage that is even close to that now available to the incumbent LECs. In contrast, if unbundled switching and the UNE-P combination were available, CLECs could begin competing for a large portion of all customers immediately, assuming that incumbent LECs also provided the nondiscriminatory access to their operations support systems and other unbundled elements essential to the development of competition.

Third, as the Commission previously held, the fact that large CLECs have "'vast resources and access to capital'" is not a sufficient basis for imposing restrictions on access to unbundled elements that "'would have the effect of prohibiting'" those CLECs from providing service to particular segments of the market because of the high cost of facilities-based entry compared to the incumbent LEC's costs. *Texas Build-Out Preemption Order*, 13 FCC Rcd 3460, 3498 ¶ 78 (1997) (citations omitted); *see id.* at 3496 ¶ 74. Thus, even assuming that a CLEC were capable of making the enormous capital investment needed to implement a switch-based entry strategy "on a state-wide basis" (*id.* at 3498 ¶ 78), the critical question is whether such an investment, if made, would allow the CLEC effectively to compete with the incumbent. A large investment in switching would make economic sense, for example, for a CLEC that planned to offer local telephone service through the use of cable telephony, because with cable telephony the CLEC customers' loops will terminate at the CLEC's switches. Conversely, attempting mass market entry *solely* by buying switches and relying on the incumbent LECs' unbundled loops makes no economic sense. As set forth below, such a market entry strategy both would put CLECs at a prohibitive cost disadvantage with respect to most customers, and also would relegate CLECs to offering a service that today is error-prone even in small volumes and that could not be scaled to accommodate mass-market entry.

b. CLECs Incur Inherently Higher Costs Than Incumbent LECs Incur To Bring Their Customers' Loops To Their Own Switches.

CLECs are at a substantial cost disadvantage compared to incumbent LECs because of the costs CLECs incur to bring unbundled incumbent LEC loops to their own switches. The incumbent LECs' switches are deployed in the same location where their customers' loops terminate. As a result, the incumbent LECs can connect those loops to their switches quickly and inexpensively. The incumbent LECs enjoy this obvious – but competitively critical – cost advantage solely by virtue of their historic status as the sole providers of local service. Unlike incumbent LECs, CLECs face inherently higher costs to connect their switches to their customers' loops, because CLECs' switches are typically located some miles away from the incumbent LEC's central office, where customers' loops initially terminate. The costs that CLECs uniquely face to extend their customers' loops from a given incumbent LEC central office to one of the CLEC's switches can be grouped into three general categories:

i. The costs required to bring customers' loops from the incumbent LECs' facilities to collocated space controlled by the CLEC, including the incumbent LEC's non-recurring charges for coordinated hot cuts, and the costs the CLEC directly incurs to oversee and monitor the coordinated hot-cut process to minimize the adverse impact upon its customers;

ii. The capital costs required to build or lease a capability to extend the loops from the incumbent LEC central office to the CLEC switch, including the costs of establishing collocated space, equipping that space with items such as digital loop carriers (DLCs) and multiplexers, deploying or leasing dedicated transport from the collocation space to the CLEC switch and managing and engineering these activities; and

iii. The inefficiency that would result from having to design and build a network before knowing who the customers are and what their traffic patterns require.

Each of these costs is described in more detail below. Taken together, they are so high that they preclude a rational CLEC from attempting to enter the local market on a broad, mass market basis using its own switches. For example, even in a state such as New York, where CLECs have installed the largest number of their own switches to serve particular market segments, the start-up costs associated with just a portion of these activities are substantial. The non-recurring charges for coordinated hot cuts in New York will be about $45 per line and the costs for CLECs to purchase DLCs and to install them in collocated space will be about $117 per line. Pfau Aff. ¶¶ 21-27 . Thus, even omitting many of the costs above, CLECs in New York would incur over $160 per line for these two costs alone to extend loops to their switches – nearly all costs that incumbent LECs do not incur. In contrast, the non-recurring costs of establishing a service arrangement in that state using an unbundled platform of network elements are about $7.00 per line, a difference of over $150 per line. *Id.* ¶ 33. Because the monthly loop charge for a typical residential customer in New York City is only $2.50 less than the monthly costs for UNE-P, it would take a CLEC more than 5 years to recoup just the above-quantified portion of the upfront customer-specific costs of extending the customer's unbundled loop to the switch. *Id.* ¶ 33 & n.15.

This substantial cost disadvantage demonstrates why CLECs have not – and could not – serve all customers using their own switches and unbundled incumbent LEC loops. With an inherent cost disadvantage of that magnitude, CLECs deploying their own switches could financially justify competing only for customers that have substantial telecommunication needs

beyond basic dial tone access. Indeed, one incumbent LEC even admits that, under its own highly flawed model of CLECs' revenues and costs, CLECs could ***not*** profitably use a switch-based entry strategy to serve 70 percent – almost 3 out of 4 – of all residence customers and "would actually lose money on th[at portion of] residential customers." *See* SPRI, Description of the TELCOMP Model and Results of its Application to the Atlanta LATA, at p. 7 (Jan. 21, 1999), submitted to the FCC by BellSouth Corp. in CC Docket No. 98-121 (Feb. 11, 1999) (Exh. F); *see* Klick/Pitkin Aff. ¶ 16 & n.5 (discussing same).[184] In short, both AT&T's data and an incumbent LEC's own cost model show that CLECs could not serve substantial portions of the market if they were denied access to unbundled switching and combinations using the switching element. That result not only defeats the Act's central purpose of opening all local markets to competition, but also substantially "impairs" – under any reasonable definition – the CLECs' ability to provide competing local service.

i. CLECs Incur Substantial Costs To Move Customers' Loops To The CLEC's Collocated Space Within The Incumbent LEC's Central Office.

The first step for any CLEC that wishes to use its own switch to provide local service is to bring its customers' loops to its collocation space in the incumbent LEC's central office. This is accomplished by means of a manual process known as a coordinated hot-cut. That process requires incumbent LEC technicians to perform manual work to disconnect the customer's loop from the incumbent LEC's switch and reconnect it to the CLEC's facilities, while simultaneously ensuring that other incumbent LEC technicians take steps electronically to reassign or "port" the customer's telephone number from the incumbent LEC's switch to the CLEC's switch – a

[184] The Klick/Pitkin Affidavit describes in detail the numerous flaws of the TELCOMP Model and demonstrates (i) that the Model cannot be relied upon to support its basic premise; and (ii) that correction of only some of its errors reverses the Model's conclusions.